

ENGINEERING INVENTIONS.

A valve gear has been patented by Mr. John W. Taylor, of Pittston, Pa. It is a contrivance of a radially grooved rocking disk worked by an eccentric, with valve rod and shifting lever and connections, making a simple, variable cut-off and reversing gear with a single eccentric, and dispensing with the link motion commonly adopted for the purpose.

A rail chair has been patented by Mr. Samuel M. Beery, of Omaha, Neb. It forms a bearing for the ends of the rails and holds them together; it is formed in sections, each with a base plate projecting from the inner surface, and provided with pins, which pass into apertures in the rails held at their ends between the sections.

A derrick has been patented by Mr. Patrick Kelly, of Poughkeepsie, N. Y. The invention consists in the combination with the cross beam, braces, post, and carriage of a derrick, of sliding extension bars and their operating ropes, so the derrick can be readily secured in place and released, or moved forward and run back to a safe distance when a blast is to be fired.

A link motion for engine valves has been patented by Mr. Thomas J. Walden, of Lebanon, Ind. This invention covers a novel arrangement and construction of parts, by means of which the steam supply may be cut off or varied at will according to the load on the engine, also facilitating the starting of the engine, constituting a variable cut-off, and preventing waste of steam.

A gripping attachment for traction cable systems has been patented by Mr. Orlando H. Jadwin, of New York city. It may be closed upon the cable with a slight movement of the operating bar, and when the strains on the attachment is pulled a little out of the normal line of the cable to avoid hammering against the pulleys, whether operated in a forward or backward direction.

A mechanical movement has been patented by Mr. Ira F. Monell, of Sugar Loaf, Col. It is adapted for use with an ore sizer, and to convert rotary motion into reciprocating, giving the pan quick backward and slow forward strokes, to cause the pulp to advance along ascending sieves, to enable the length of the stroke to be regulated at will, and with other novel features.

A water elevator has been patented by Mr. Albert Van Ness, of Lowell, Mass. It is for raising water from deep wells, and the driving shaft and drum carrying the hoisting rope are connected by three gear wheels, the intermediate one pivoted to a swinging hanger, and connected therewith by a spring held lever latch, with a trip spring, stop roller, and reversing wheel, so the motion of the drum may be automatically reversed.

A method of and apparatus for cutting channels in waterways has been patented by Mr. John Gates, of Portland, Oregon. It is practically a sluicing process, by directing a current of water forced back from a stern paddle wheel on shoal or bar, and covers a novel arrangement of the vessel to swing on a pivot at the bows, and be there held while the stern is swung from side to side. The same inventor has also patented a method and means for cutting submarine channels by the action of a harrow hauled over a bar or river bed assisted by the natural currents of the water way.

AGRICULTURAL INVENTIONS.

A hay rack has been patented by Mr. Robert Griswold, of Woody, Kan. The sills, cross bars, and side bars of an ordinary hay rack are provided with peculiarly constructed ends and sides to confine the hay while being transported, and allow the rack sides to be readily detached for convenience in unloading.

A cotton planter has been patented by Mr. Louis S. Flatau, of Pittsburg, Texas. It has a funnel-shaped hopper and axle driven by a worm and worm wheel, held erect by a stationary tube with flaring upper end, and carrying the furrowing plow, a screw in the stationary tube causing the seed to be fed out by the revolution of the hopper.

MISCELLANEOUS INVENTIONS.

A shoe fastening has been patented by Mr. Daniel T. Chambers, of Washington, D. C. It is a blind strap lace of two thicknesses, the under layer having eyelets along each of its edges adapted to be successively caught over projecting hooks on the edges of the slit in the shoe.

An incandescent electric lamp has been patented by Mr. James W. Benson, of North Adams, Mass. It is constructed with a spring pawl attached to the globe cap and engaging with ratchet teeth formed upon the outer surface of the insulating ring, so the globe will be locked against accidental displacement.

A seal lock has been patented by Mr. Owen E. Newton, of Fort Madison, Iowa. It is for locking freight car and other doors, and may be adapted for a spring key, or have a projection by which the bolt may be driven or a leaden shot may be used as a key, the construction having many novel features.

A vehicle wheel has been patented by Mr. George D. Smith, of Glenn Springs, S. C. This invention provides means for excluding dust and dirt from the wheel bearing, and means whereby the wheel may be readily taken apart for repairs, the rim being of such construction that it may be loosened and tightened at will.

A bottle for aerated and gaseous beverages has been patented by Mr. James Vidie, of Pantin, France. The bottle is made by first blowing the ball of metal in a polygonal mould, and then rolling the ball while distended by blowing in a second mould of cylindrical form, the improvement consisting in the process of manufacture.

An indicator lock has been patented by Mr. Thomas B. Ashford, of Clinton, N. C. A wheel is set to show a different number each time the lock is opened, to prevent the lock being opened and closed by an

unauthorized person, the changes in numbers showing through an opening in the lock, and giving proof of its surreptitious opening.

A fire escape has been patented by Mr. Alexander J. Windmayer, of Fort Madison, Iowa. It consists of a tubular bag or chute with one end connected to a frame hinged to a truck, with a top cross bar having lateral extensions to rest against a window frame when the bag or chute is extended, the frame also being connected to the truck by jointed braces.

A fire escape has been patented by Mr. Sylvester A. Price, of Eureka, Kansas. A drum like device has been attached to and wound upon it a lowering wire or rope, with means for attaching the device to the body of the person descending, and also means for controlling or regulating the descent, embracing novel construction and great simplicity of operation.

An automatic feed for printing presses has been patented by Mr. Andrew R. Bennett, of Utica, N. Y. This invention covers a construction to enable such presses as the Gordon oscillating, such as used in many job printing offices, to be fed by an entirely self-acting mechanism, so the press will require no attention except to supply it with the blank sheets in a pile.

A paper cutting machine has been patented by Mr. Robert Atherton, of Paterson, N. J. In combination with cutters or knives are devices for transmitting motion to them from a drum or roller revolved by the paper passing over it, to cut a roll of paper into bands or strips, as rapidly as the paper is rolled, without danger of tearing.

A machine for scraping and splitting cane has been patented by Mr. Edward M. Ellis, of Gardner, Mass. It has a series of feed rollers, with mechanism for scraping cane or rattan, with a knife for splitting the cane, with suitable centering devices to guide the cane in such manner that it passes precisely centrally through the scraping and splitting devices.

A barrel former has been patented by Mr. Thomas L. Lee, of Memphis, Tenn. This invention relates to former patented improvements of the same inventor, and consists in such peculiar construction and arrangement of parts as permit a barrel to be quickly made without skilled labor, different forms of barrels being provided for.

A floor clamp has been patented by Mr. Edward W. Holt, of Corinna, Me. The invention consists in a clamp operated by means of toggle bars, or bars arranged on the lazy tongs principle, the spurs being forced into the floor by the foot of the operator, and the clamp retained and prevented from slacking up while the boards are being nailed.

A combined ventilator and damper has been patented by Messrs. Franklin R. Hogeboom and Geo. O. Woolcocks, of Brooklyn, N. Y. This invention is intended to be applied in connection with the flues or pipes of stoves and furnaces, and consists in having a damper within that portion of the flue that enters the central portion of the ventilating register, with other novel features.

A plane has been patented by Mr. Charles H. Pike, of West Troy, N. Y. It is a wood plane with its stock in two parts, so as to be adjusted at any required angle with each other, to dress roughed out work to the required transverse curve as the plane is rocked axially while being passed backward and forward over the work, the faces of opposite parts of the stock resting on true edges of the work.

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Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 141.

Curtis Pressure Regulator and Steam Trap. See p. 286.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 286.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 270.

Drop Forgings. Billings & Spencer Co., Hartford, Conn. We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Name and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or mail, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) C. E. R. asks (1) how to preserve the carapax of a turtle. The scales on the outside surface always peel off. What will prevent it from peeling? A. Rub the inside of the carapax with the preparation such as is used for stuffing birds or animals. This is made of camphor, 1 ounce; corrosive sublimate, 1 ounce; alum, 1/2 ounce; sulphur, 1 ounce; all finely powdered, and mix. It is then hung up in some loft to dry out, and finally varnished. 2. Please give recipe for a good varnish with which to varnish the turtle shell. A. Any good solid body varnish will do. French polishing varnish of a light color will be found most satisfactory. This varnish can be purchased from almost any store.

(2) C. E. W. writes: 1. I want to know how much water my engine is using, by card. I have Bacon's formula, which I need not quote; also Roper's method, viz., divide the constant number 859.375 by the M. E. P. and the terminal volume. I have worked up a card by both rules, and the results are very far apart. Which is right? I want to get hold of a general rule that is applicable to all kinds of engines, and one that is right. A. Bacon's is approximately correct, only there should be deducted from the weight of steam, as obtained from card, the weight of steam compressed by the piston, as this steam enters this cylinder at the next stroke, and hence is a portion of the steam by which the card of the succeeding stroke is produced. 2. What is the use of making the clearance a factor in a problem of this kind? Does not the terminal volume take cognizance of the clearance every time? A. No; the clearance space is a part of the space filled by the incoming steam, and in which the steam expands as in the cylinder. No correct comparison between the card produced and a theoretically correct card can be made without taking the clearance space into the account. 3. In compiling steam tables, eminent authorities differ

widely. I have Haswell, but he does not agree with some other engineers. Where shall I find some standard facts about steam, something I can bet on? I want a good handy book on indicators, etc., one that ordinary brains can take in, and that means sans algebra. A. Regnault's table of the properties of steam is the standard generally accepted; you will find it in "Barus on the Indicator"; "Goodeve on the Steam Engine" you will find a very useful book. For the uses of the indicator "Ray's 20 Years with the Indicator" will give you much information; also Steam Engine Indicator, by Le Van.

(3) M. C. W. writes: Can you recommend an article or how to prepare a substitute to represent the gas discharged from the burning anthracite coal? My trouble is a thickening of the mucous lining of the bronchial tubes of a non-inflammatory character; everything in the way of treatment has proved useless. A. The gases generated by the combustion of coal are principally carbon monoxide and carbon dioxide; both of which are poisonous. It may be that the oxygen treatment would relieve you, but under all circumstances it is both cheapest and best to consult some competent physician.

(4) A. L. asks for information for making an alloy of copper and aluminum. Does it require a special flux for obtaining a good soft and ductile product? If so, what kind of flux? I have tried without flux, only covered with charcoal powder, and got the metal very brittle. Are blacklead crucibles to be used, or sand crucibles? A. Use sand crucibles with borax flux. Use only from 5 to 10 per cent aluminum. Melt the copper first, add the aluminum in small pieces. Stir with a charred stick of hard wood held in a small tongs. For large quantity, as a 25 to 50 pound melting, the plumbago crucibles may be used.

(5) G. W. L. asks (1) the best cement for a fish aquarium. A. Take equal parts finely ground charge, fine white sand, and plaster of Paris by measure, and one part finely pulverized resin. Mix, thoroughly dry, make into a putty with boiled linseed oil to which a little drier has been added. Beat the mixture well, and let it stand 3 or 4 hours before using it. This makes a strong and durable cement for both fresh and salt water. 2. With what shall I paint the inside? A. Make a varnish of shellac and methylated spirits of wood alcohol with zinc white, thin enough to flow freely with a brush; paint quickly, for it dries at once. A small portion of gutta percha dissolved with the shellac gives a polish to the paint.

(6) E. N. asks how to make a good covering to steam boiler, to apply upon it like plaster or mortar, and avoid caloric radiation. A. Mix asbestos with a little clay and plaster of Paris dry. Then wet the mixture with water quickly, and put on boiler with a trowel. Mix in small batches, as the plaster of Paris sets quickly. Short cattle hair makes good felting treated above in place of asbestos. Chopped straw has also been used where nothing better is at hand.

(7) C. S. P. asks if there is any acid that will mix with oil. If so, what is it? A. Most of the essential oils are soluble in concentrated acetic acid.

(8) M. E. S. sends impressions of three coins, and desires to know what they are and their value. Also where a catalogue can be obtained. A. No. 1 is a Danish coin of no value. No. 2 is a U. S. token piece; would sell for about 50 cents. No. 3 is a modern Greek coin of no value.

(9) J. J. A. asks the size boat to make for an engine 2 1/2 x 3 1/2 inches, and boiler that will furnish plenty of steam. A. 23 to 24 feet length, and 4 feet beam. Vertical tubular boiler, 25 inches diameter and 44 to 46 inches high.

(10) E. W. S. writes: Will you give me a receipt for an enamel or varnish that will adhere to a galvanized iron tank, and when beer is heated in it to a temperature of 210° Fah., will neither taste the beer nor come off? A. There is nothing to our knowledge that is trustworthy for holding hot beer, but a clean, pure copper surface. If there is anything, it would have been discovered before this by the brewing community.

(11) H. L. S. asks: Will a bullet fired from a smooth bore have as much penetration for the same amount of powder as one fired from a rifled gun? Or, in other words, does the twirling of a bullet add to its power of penetration? A. Round bullets of the same weight, and with the same weight and quality of powder, also with equal length of barrel, are supposed to have the greatest range and penetration from the smooth bore. The rifling of guns is for accuracy of range, and for the purpose of giving elongated bullets a spinning motion, to prevent turning over as well as for accuracy of range. The twirling does not add to its power of penetration.

(12) J. G. G. asks how to make "Chinese cement" for leather and other articles. A. Chinese glue is made by covering shellac with strong liquid ammonia and shaking frequently until dissolved. The solution takes some time to form, and is facilitated by standing, placing the bottle (well stoppered) in a moderately warm situation, and briskly agitating it at intervals. Bleached shellac gives a lighter colored cement, but it is not considered as strong.

(13) C. N. S. asks how to project on a screen the object through a microscope. I understand that it can be done very successfully, and I should like to know how to construct such an apparatus. A. You can project microscopic objects on a screen by using the microscope objective in exactly the same manner as a magic lantern tube is used, with proper illumination and a condenser for concentrating the light on the object; you would have no difficulty in projecting the objects.

(14) J. C. S. asks whether there are any small boats now running by means of chemical engines. A. We know of no boats in regular use which are driven by chemical engines.

(15) E. H. McF. asks how to make a soldering solution that does not contain any acid. A. Try oil, or a solution of resin in turpentine.